ABSTRACT

Non-destructive testing apparatus according to one embodiment of the invention comprises a photon source. The photon source produces photons having predetermined energies and directs the photons toward a specimen being tested. The photons from the photon source result in the creation of positrons within the specimen being tested. A detector positioned adjacent the specimen being tested detects gamma rays produced by annihilation of positrons with electrons which are indicative of a material characteristic of the specimen being tested.